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women and child health at scale

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paper6

supplemental feeding: it's role in a large scale maternal and child nutrition and health program

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Supplemental Feeding: It's Role in a Large Scale Maternal and Child Nutrition and Health Program

Abstract

Background and Interventions

CARE-India has a long history of supporting the supplementary nutrition component of the Integrated Child Development Services (ICDS) program in several ways. Integrated Nutrition and Health Project (INHP) was built on to this platform, bringing in additional support for child health and nutrition interventions, including home based newborn care, infant and young child feeding, primary immunization, and the promotion of micronutrients, iron-folate and vitamin A. In 2002, after the Government of India (GoI) disallowed distribution of bio-engineered food, CARE stopped supplying Corn Soya Blend to ICDS but continued to provide technical assistance to ICDS for managing commodity supply and distribution. This working paper discusses INHP-II strategies, approaches, experiences and results of the supplemental feeding component of program, analyzes the influence of supplemental food on health service coverage and briefly discusses the costs and benefits of supplemental feeding.

Methods

Evidence is drawn mainly from state-level estimates of indicators from program baseline and endline surveys, district-level estimates from three rounds of periodic assessments from one district in each of the eight project states and from an evaluation research study conducted in one district to assess the impact of the INHP interventions on nutritional status, which included two intervention and two comparison districts. Each of these surveys asked mothers of children 0-23 months old about the receipt of food supplements from the Anganwadi Center (AWC) of the ICDS program, either as spot-feeding or as take-home rations (THR). Information on socio-economic background and service coverage was available from all surveys to examine associations with the receipt of supplementary nutrition. All estimates presented in the results pertain to INHP-assisted regions within the respective states and districts.

Results and Discussion

The reach of food supplements, already moderately high at the baseline in most states, improved to variable extents across states, reaching around 80 percent of the families interviewed in most age groups in five states. In Rajasthan and Uttar Pradesh coverage rates remained below 50 percent at the endline, while, in West Bengal, they reached just ov[illegible]on research study indicates that increments over projec[illegible] higher in RACHNA-assisted districts. Also, consump[illegible]ldren was significantly higher in the RACHNA-assi[illegible]ms of improved reach of food supplements to fam[illegible]uled castes/tribes groups. Disruptions in commo[illegible]ered foods and usage of the average planning fig[illegible] irrespective of the size of the catchment ar[illegible]imited reach of food supplements.

Coverage of all health services, whether thos[illegible]on and micronutrient supplementation, or those[illegible] and

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Background

The RACHNA program

The RACHNA program of CARE India included two USAID-supported projects: the second phase of Integrated Nutrition and Health Project (INHP-II), which focused on child health and nutrition, and the *Chayan* project, which supported interventions for promoting birth spacing and the prevention of transmission of HIV/AIDS among groups at high risk. INHP-II, built upon the lessons and experiences of the first phase, was implemented in 747 Integrated Child Development Services (ICDS) blocks[1] in 78 districts across nine states[2] from October 2001 to December 2006 to complement the maternal and child health and nutrition (MCHN) efforts of the ICDS and the Ministry of Health and Family Welfare (MoHFW) programs. To achieve its goal of "sustainable improvements in the nutrition and health status of seven million women and children", INHP-II adopted a two-track approach – supporting service providers to improve the quality and coverage of MCHN services and systems and engaging communities to support better infant feeding and caring practices and sustain activities for improved maternal and child health and survival. The implementation was facilitated by small program teams of CARE, located at the district, state and national levels, and working closely with the functionaries of the ICDS program and the programs of the MoHFW, and with a range of partners, including local NGOs and Community-Based Organizations (CBOs). The main strategies were strengthening of existing systems, behavior change communication and capacity building. A detailed description of the program can be found in the paper, *Program Description*, in this series.

This working paper discusses INHP-II strategies, approaches, experiences and results pertaining to the supplemental feeding component of the program, analyzes the influence of supplemental food on health service coverage and briefly discusses the costs and benefits of supplemental feeding.

Role of Supplemental Feeding in the INHP

Supplemental Food as an Incentive

Since the inception of ICDS in 1975, CARE has supported its supplemental feeding component with USAID-provided PL 480 Title II food commodities. INHP-II delivered the USAID-provided Corn Soya Blend (CSB) and Refined Soyabean Oil (RSO) for supplemental feeding in its program areas. With the Government of India (GoI) decision, in July 2002 to disallow the import of CSB due to its bio-engineered soyabean content, state government-provided grain eventually replaced CSB and was combined with the Title II RSO that continued to be delivered.

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[1] A block is an administrative sub-unit of a district, having a population of around 100,000, and often larger. An ICDS block is usually identical to the administrative block, and comprises about 100 *Anganwadi* Centers (AWC). Not all blocks in a district and not all villages and hamlets within a block may be served by the ICDS program. INHP-II was designed to be implemented only in ICDS-served blocks, but did not necessarily cover all ICDS blocks in the districts where it was implemented.

[2] These include Andhra Pradesh (AP), Bihar (BI), Chhattisgarh (CG), Jharkhand (JH), Madhya Pradesh (MP), Orissa (OR), Rajasthan (RA), Uttar Pradesh (UP) and West Bengal (WB). Since the program was implemented in Bihar only from late 2004 onwards, results presented are only from the other eight states.

Prior to INHP, CARE's assistance to the ICDS was limited to supplemental food provision and technical assistance to improve its management. In 1997, with the launch of the INHP, the assistance was expanded to include support to the ICDS and RCH programs to improve their health and nutritional components, in addition to the supplemental feeding support. The INHP strategy, while recognizing the nutritional support of calories and proteins that supplemental food provides, positioned it as an incentive to attract families and communities to avail of services and promoted approaches to integrate supplemental food and health service delivery, thus bringing about operational convergence between the ICDS and health sector programs.

Approaches to Improve ICDS-Health Convergence and Coverage

Catchment area approach

The catchment area approach primarily served to identify and enroll all program beneficiaries in the *Anganwadi* Center (AWC) catchment area, especially pregnant women, nursing mothers and children under three years of age and families living in the left-out areas, far off hamlets, hard-to-reach pockets and Scheduled Caste or Scheduled Tribe (SC/ST) pockets. A village mapping exercise, generally led by the *Anganwadi* Worker (AWW) with the support of the ICDS Supervisor was frequently used for the purpose. In some cases the Auxiliary Nurse Midwives (ANMs), members of the panchayat, CBOs and community members were also involved. Such a map provided to the service providers and the community members, a visual depiction of who is supposed to receive services and who is being left-out from the service fold. In many villages, with or without maps, service registers were periodically updated with a focus on including the left-out households.

Nutrition and Health Day

For the effective delivery of a package of nutrition and health services, INHP-II promoted a fixed-day and fixed-site delivery of services by the AWW and ANM through Nutrition and Health Days (NHDs). The NHD operationally linked supplementary food distribution in the form of Take Home Rations (THR) and the delivery of health services at the AWC such as immunization, antenatal care, vitamin A supplementation, distribution of iron and folic acid (IFA) tablets and growth promotion.[3] The AWW and the ANM together delivered these services assisted by a cadre of community volunteers, called Change Agents,[4] wherever these had been identified and trained. The NHD approach was expected to: (i) help overcome the barriers that pregnant and lactating women, and children under three faced, such as the opportunity cost of coming to the AWC on a daily basis at mid-day to receive the supplemental food, by introducing THR distribution once a fortnight/month; (ii) decentralize immunization and antenatal care services from health sub-centers to villages, provide them on a predictable basis, and make the AWC the focal point for service delivery in the community as against the earlier practice of the ANM making door-to-door visits to households without any prior information; (iii) enhance operational coordination between the

[3] Supplemental food provision was not conditional to health service receipt. It should be mentioned here that take-home ration (THR) is given out either weekly, fortnightly or, monthly and only one of these several THR sessions is coordinated with fixed-day fixed-site immunization/ANC services. Also, while all families are eligible for THR as per the distribution schedule, a given infant in a family is due for immunization only on about five days in the year.

[4] For details of the Change Agent approach refer the Working Paper, "Engaging communities to improve health and nutrition outcomes: *The Role of Community Volunteers* in INHP".

two programs to the benefit of communities, and afford concrete mechanisms for either program to monitor provision of critical services; and (iv) provide a forum for community participation in the program and to involve community volunteers, panchayat members and community-based organizations, e.g., women's self-help groups in the NHD activities. The papers of *Working with Existing Systems* and *The Role of Community Volunteers in INHP* in this series discuss the lessons learned on varied aspects of NHDs, including what it took to introduce and sustain NHDs.

Mechanisms to improve recording and tracking

INHP promoted tools to track coverage and reduce drop-outs for the various services delivered at the NHD. Tracking of the critical groups, i.e., pregnant women, nursing mothers and children under three, drawing up "immunization due lists", modifying registers to track mother-child pairs, making better use of information are some examples of such efforts.

Capacity building

Capacity building of ICDS and Health systems functionaries at all levels from state to village, especially the Child Development Project Officers, Supervisors and AWWs helped ICDS and Health focus on how and who to target, why and how to organize NHDs and how to manage supplement food commodities. Topics such as population-based beneficiary identification and enrolment, data analysis and its use for decision making, need-based procurement and allocation of food commodities, operationalization of the NHD and catchment area approach were included.

Strengthening food commodity management and logistics

INHP-II provided technical and operational support to the ICDS program at all levels for effective supplemental food supply chain management to improve the regularity and availability of food commodities at the AWC. Tools to assess the actual requirement of food commodities, their timely indenting, procurement, allocation, transportation and distribution, software packages for inventory control and food accounting were developed and institutionalized. For example, INHP developed and promoted a system of population-based beneficiary allocation for supplementary food. This helped the ICDS in recognizing the need to focus on population based planning to widen outreach for effective coverage of the most vulnerable populations and improve the number of supplemental feeding days (ICDS stipulates 300 feeding days in a year). The joint ICDS-CARE team review visits to AWCs helped ICDS understand and resolve day-to-day bottlenecks in the management of supplemental feeding.

Methods of Assessment

This paper draws evidence from two data sources described below, the baseline-endline surveys and the evaluation research studies. For both, the AWC was the Primary Sampling Unit (PSU) and both surveys asked simple questions to mothers of children 0-23 months old about the receipt of food supplements from the AWC either as spot-feeding or as THR, during pregnancy, lactation (0-5 months post-childbirth) and after the index child was six months old. The surveys did not collect information about the regularity and quantity of supplemental food received due to the strong potential of errors associated with recall of events going back several months. Since the surveys dealt extensively with services

received and since they collected information on the socioeconomic background of the respondents, it is possible to examine correlations between the receipt of food supplements and these independent and potentially dependent variables.

Baseline and Endline Surveys

Baseline and endline surveys of INHP-II provided state-level estimates for selected indicators. The endline survey of INHP-I (early 2001) served as the baseline survey of INHP-II. The INHP-I endline for Bihar served as the baseline for Jharkhand and the Madhya Pradesh endline served as the baseline for both Madhya Pradesh and Chhattisgarh, since the new states of Chhattisgarh and Jharkhand were created from a division of the erstwhile Madhya Pradesh and Bihar respectively, just prior to the INHP endline survey.

INHP-I consisted of three kinds of program areas based on intensity of interventions and effort: the "High impact" blocks, "Capacity building blocks" and "Other blocks". The 2001 survey was designed to generate separate estimates of these three areas through a multi-stage sampling design: a fixed number of blocks and PSUs (AWCs - *Anganwadi* Centers) were randomly picked from each of the three areas 540, 540 and 832 respondents (mothers of children 0-23 months old) were selected respectively using a predetermined random selection process. The interview tool was common to all children 0-23 months, and covered all interventions supported by INHP – antenatal, natal and newborn care, infant feeding and immunization. State-level estimates, derived by applying population weights to the three areas, are used for all comparisons with the endline, without reference to the three kinds of program areas.

The endline survey of INHP-II (early 2006) used a multistage sampling design, but this differed in some respects from the baseline. The respondents (mothers of children 0-23 months old), were drawn from two groups. The mothers of children 0-5 months of age were asked questions related mainly to antenatal, natal and newborn care and breastfeeding, while mothers of children 6-23 months old were interviewed with questions mainly related to complementary feeding and immunization. This was done to minimize recall bias and capture more recent events, likely to have been influenced by program interventions. The sample size was sufficient to detect a 10 percent point difference in an estimate with 95 percent confidence limits and 80 percent power, and an assumed maximum design effect of 1.8. Birth rates were factored into the selection of number of PSUs and blocks in each state. Blocks were selected in a manner that ensured proportionate representation of urban, rural and tribal blocks, and PSU selection within a block ensured proportionate representation of demonstration sites, replication sites and other sites.[5] Sampling frames were generated for children 0-5 months and 6-23 months old by prior house-listing and the target sample picked by circular systematic sampling, making allowance for a non-response rate of 15 percent. For each group, the target number to be completely interviewed was 733. Effectively, this resulted in a virtually self-weighted sample for each state.

[5] Demonstration site is an INHP-II AWC that holds a Nutrition and Health Day at least once a month, has a community group that manages nutrition and health activities, at least three active Change Agents and other need-based innovations.

The Nutrition Evaluation Research Study Design

Research

The nutrition evaluation research study was conducted by the Johns Hopkins Bloomberg School of Public Health to assess the impact of the INHP intervention package on the nutritional status of children 0-23 months old, when implemented at scale. The study lasted two years. It was located in two program districts – Barabanki in Uttar Pradesh and Karimnagar in Andhra Pradesh, using ICDS covered areas in Unnao in Uttar Pradesh and Rangareddy in Andhra Pradesh as non-intervention comparison. The study used a quasi-experimental pre-post design with multi-stage sampling. The baseline survey was conducted in 2003 and the endline survey was contemporaneous with the RACHNA program endline survey in early 2006.

Although data on children's nutritional status is available from the baseline-endline and the evaluation research, the exclusive effect of supplemental food on nutritional status is not examined. This is because, the INHP-II hypothesized that supplemental food was only one of the many factors to improve nutritional status, other important factors being appropriate infant and young child feeding practices, prevention and treatment of infections, and food security. Thus, the surveys were not designed to evaluate this effect.

In tabulating and presenting results, estimates of indicators are presented separately for each district or state as the case may be, and in most cases, the average program-wide estimates are not emphasized. This pattern has been followed to retain the focus on individual states and districts, among which there is considerable variability.

Also, statistical significance tests are not presented for most primary results, such as when comparing estimates for indicators across baseline and endline surveys, or across rounds of periodic rapid assessments. Most of the surveys were large sample surveys, designed to detect differences of 10 percentage points or more between two comparable rounds. While confidence intervals or p-values could have been presented, this would have made the already large tables, each bearing results from eight states or districts, even less user-friendly. Instead, the authors have taken the view that it is safe to assume that a difference of 10 percentage points or more between rounds is likely to be statistically significant in most cases, and that showing statistical significance for differences of less than 10 percentage points may not be convincing from a program perspective. Thus, descriptions of results also generally distinguish between differences of 10 percentage points or more (as being statistically significant and programmatically relevant in most cases), and lesser differences (as being not convincing in most cases). While this approach oversimplifies the presentation of results, it should help the general reader interpret results more easily. More experienced and interested readers will look deeper, in any case.

Results and Discussion

Supplemental Feeding Coverage and Associated Factors

Coverage

Table 6.1 compares the supplemental feeding coverage achieved at endline with the coverage at the baseline for each of the states as well as program-wide. At the

Table 6.1: **Receipt of supplemental food by pregnant, lactating women and children, 6-23 months old, Program Baseline (2001) and Endline (2006)**

	Indicator		Andhra Pradesh		Chhattisgarh		Jharkhand		Madhya Pradesh		Orissa		Rajasthan		Uttar Pradesh		West Bengal		Program wide	
			BL	EL	BL	EL	BL	EL	BL	EL	BL	EL	BL	EL	BL	EL	BL	EL	BL	EL
1	% of women* received supplemental food during index pregnancy	*N*	*1912*	*1472*	*1264*	*1472*	*1101*	*1231*	*219*	*1341*	*1908*	*1419*	*1902*	*1302*	*1219*	*1282*	*917*	*1325*	*10442*	*10844*
		%	68.6	84.4	89.4	77.1	83.3	78.2	92.8	81.4	70.5	83.8	40.2	45.3	40.8	45.1	49.4	59.9	68.2	69.1
2	% of women* received supplemental food during lactation for index child	*N*	*1911*	*1471*	*1155*	*1472*	*1045*	*1231*	*187*	*1323*	*1912*	*1414*	*1892*	*1301*	*1220*	*1279*	*916*	*1327*	*10238*	*10818*
		%	70.9	78.2	83.2	79.6	74.8	80.0	85.7	81.0	58.1	89.2	32.5	43.3	30.2	49.2	19.5	50.6	58.6	68.9
3	% of children 6-23 months old receiving supplementary food from AWC	*N*	*1386*	*759*	*671*	*746*	*652*	*642*	*118*	*691*	*1436*	*705*	*1360*	*676*	*819*	*666*	*641*	*678*	*7083*	*5563*
		%	44.0	53.8	65.9	83.6	60.5	80.5	74.6	74.6	32.3	87.4	35.3	36.6	26.3	44.4	9.2	51.7	41.7	64.7

Source: Program wide evaluation

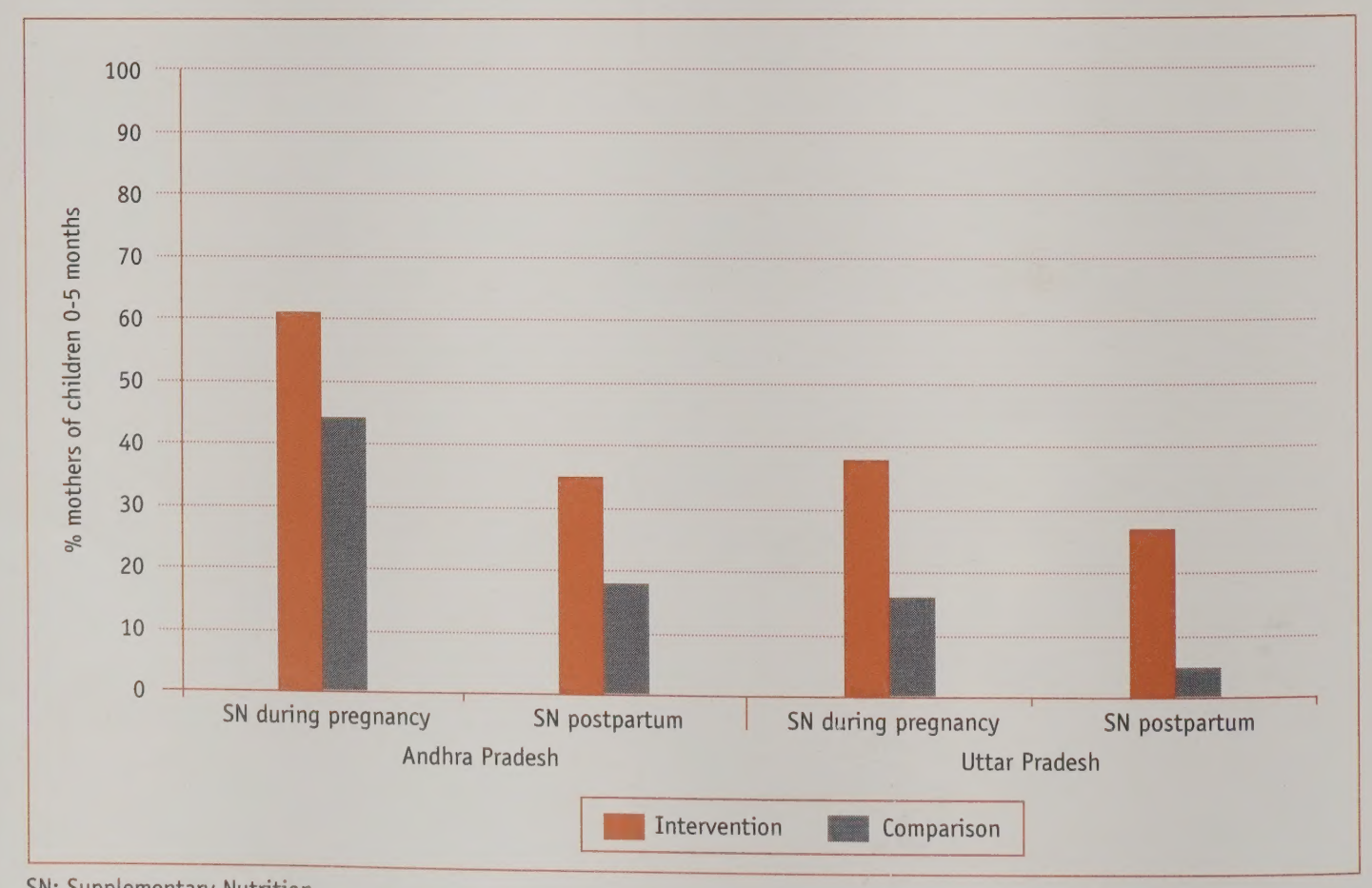
* Mother of children 0-23 months old
BL – Baseline
EL – Endline

program level at endline, 65-69 percent of mothers reported receipt of supplemental food from the AWC for themselves, during the index pregnancy or lactation periods or whose children were receiving supplemental food, either as THR or as spot-feeding. A large increment over baseline is seen in the coverage of children (6-23 months old). Wide variations are seen among states in the coverage levels, as well as in the increments since baseline. Orissa shows the highest coverage rates and substantial increases since the baseline, especially an over 50 percent point increase in coverage of children under two. In Andhra Pradesh, Chhattisgarh, Jharkhand and Madhya Pradesh coverage rates ranged between 75-84 percent, while in West Bengal coverage for the different groups varied from 52-60 percent. In Rajasthan and Uttar Pradesh coverage rates remained below 50 percent (range: 36-49 percent).

The evaluation research in both Andhra Pradesh and Uttar Pradesh showed significant improvements in supplemental food coverage during pregnancy and lactation in both the intervention as well as the comparison areas (Table 6.2). Although the intervention areas had a higher coverage than control areas at baseline (quite likely due to INHP-I interventions in the areas over the preceding five years). The relative increments observed in INHP-II areas from baseline to endline are significantly higher than those in the comparison areas, with about half of the pregnant mothers and more than a third of lactating mothers reporting receipt of supplemental food at endline. Table 6.3 shows that a significantly higher proportion of under-twos in intervention areas at endline were receiving supplemental food as compared to the comparison areas in both states.

Information on consumption of supplementary food available from the evaluation research endline survey is shown in Figure 6.1. The data shows significantly higher levels of consumption of supplemental food in INHP-II areas as compared to the comparison areas, indicating that the program was effective at increasing the intake of food supplements in the intervention districts. While in Andhra Pradesh, at endline virtually all women who received supplementary food consumed it, in

Figure 6.1: **Consumption of supplementary nutrition during pregnancy and the postpartum period in RACHNA-assisted vs comparison districts, Nutrition Evaluation Research, Endline (2006).**



SN: Supplementary Nutrition

Table 6.2: **Receipt of supplemental food during the last pregnancy, among currently pregnant women and the postpartum period mothers of children 0-23 months old, Nutrition Evaluation Research, Baseline (2003) and Endline (2006)**

	Supplementary nutrition use during pregnancy and lactation, % (n)												
	Intervention (Karimnagar)			Comparison (Rangareddy)			Difference of Change	Intervention (Barabanki)			Comparison (Unnao)			Difference of Change
	Baseline	Endline	Change	Baseline	Endline	Change		Baseline	Endline	Change	Baseline	Endline	Change	
n[1]	*2369*	*2575*		*2476*	*2656*			*2445*	*2413*		*2388*	*2306*		
During last pregnancy	38.1	62.6	**24.5**	22.4	45.5	**23.1**	**1.4**	38.9	50.2	**11.3**	24.9	19.5	**-5.4**	**16.7***
n[2]	*582*	*573*		*632*	*705*			*745*	*724*		*699*	*676*		
During current pregnancy	11.0	48.9	**37.9**	8.2	25.4	**17.2**	**20.7***	4.7	48.1	**43.4**	3.7	17.6	**13.9**	**29.5***
n[3]	*625*	*563*		*648*	*622*			*804*	*763*		*731*	*682*		
During postpartum period	19.2	42.1	**22.9**	11.0	21.2	**10.2**	**12.7***	7.3	44.0	**36.7**	5.5	14.2	**8.7**	**28.0***

n[1] = Mothers of children 0-23 months old; *n*[2] = Mothers of children 0-5 months old; *n*[3] = Mothers of children 0-5 months old.

Table 6.3: **Receipt and consumption of supplementary nutrition among children 6-23 months of age in RACHNA-assisted vs comparison districts, Nutrition Evaluation Research, Endline (2006)**

	Supplementary nutrition receipt/consumption among children 6-23 months old (%)			
	Andhra Pradesh		Uttar Pradesh	
	Intervention (Karimnagar)	Comparison (Rangareddy)	Intervention (Barabanki)	Comparison (Unnao)
Children 6-23 months	*2012*	*2034*	*1650*	*1624*
Ever received SN	46.5*	33.3	49.7*	20.3
Received SN in the past 3 months	38.3*	26.3	45.8*	19.3
Consumed SN in the past 3 months	33.8*	21.3	32.5*	12.6

* Statistical test result comparing change from baseline to endline in intervention and control districts, significant at p<0.05
SN: Supplementary Nutrition

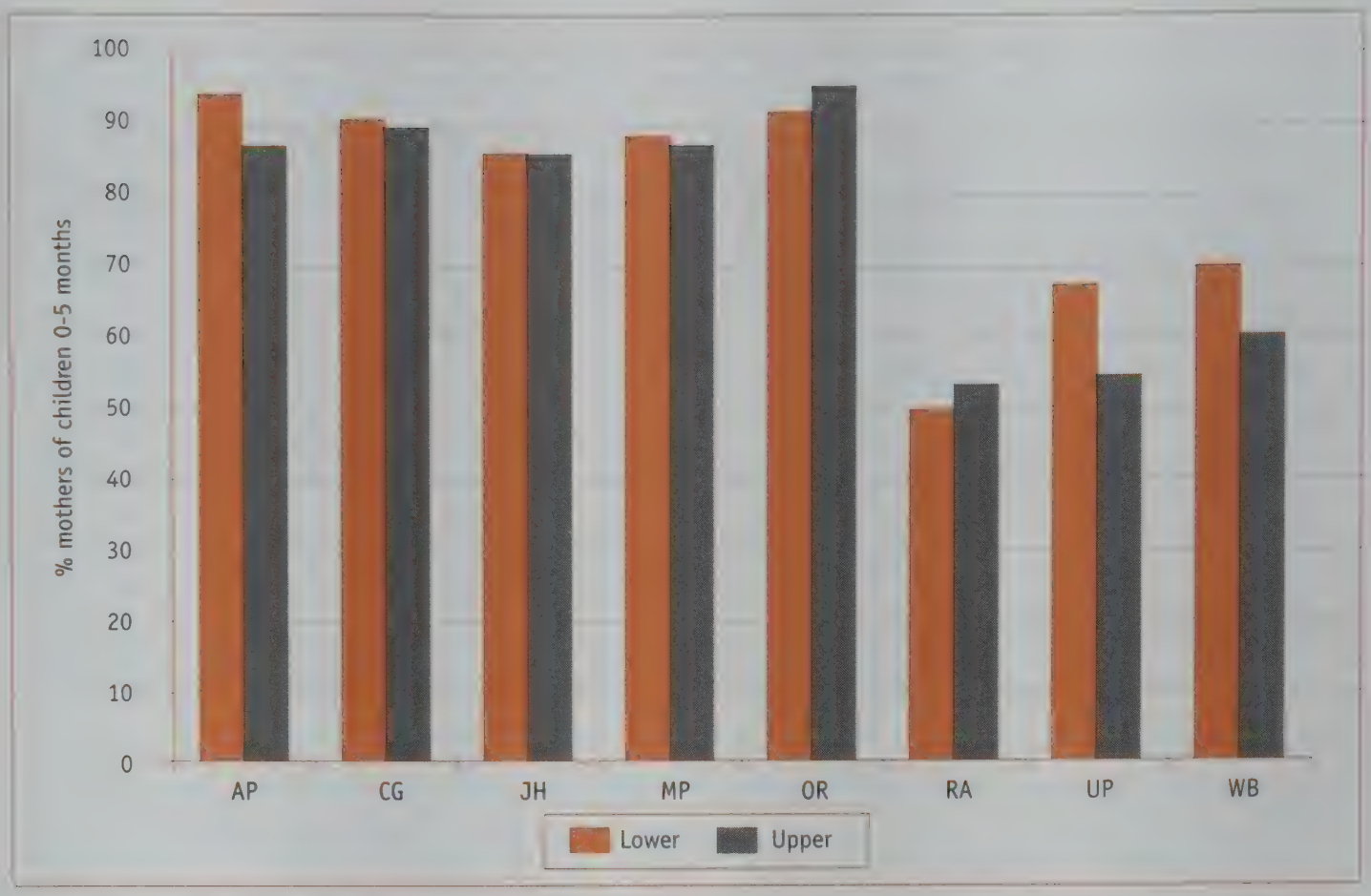
Uttar Pradesh there was a gap between receipt (44 percent) and consumption (27 percent), particularly among women during the postpartum period. Table 6.3 indicates a similar picture with respect to children, 6-23 months old. In Andhra Pradesh over a third reported to have received supplemental food from the AWC in three months before the survey and about the same proportion reported to have consumed it, whereas in Uttar Pradesh although over 45 percent received supplemental food, it was consumed by only about a third. The Uttar Pradesh data indicates possible sharing or that the food was not liked. In both, Andhra Pradesh and Uttar Pradesh, the proportions consuming the supplemental food are significantly higher in the INHP-II assisted than those in the corresponding comparison areas.

The supplemental food coverage rates seen at endline possibly reflect that ICDS efforts to universalize had not fully taken root at the time and that considerable constraints existed to limit universal coverage. Field observations and program monitoring data indicate that of the many challenges that possibly constrain coverage, one of the most critical is that of ensuring a regular and adequate supply of supplemental food at the distribution end-point, i.e., the AWC. Regular supply is influenced by a range of factors such as the timely release of budgets and procurement, satisfactory transportation and logistics arrangements, good inventory management and replenishment systems. To ensure an adequate supply, issues such as planning and estimating supplemental food requirements that take into consideration actual beneficiary levels of the AWC catchment area and allocating adequate resources for the supplemental food are crucial. While some states had announced official caps on the total beneficiaries to be covered with supplemental food, in several other states, although no formal caps were announced, operationally these were in effect due to the allocation process practiced. Irrespective of the AWC catchment area or the population it covers, a standard number of beneficiaries is generally allocated to each AWC. Due to such reasons, it is not infrequent to find AWCs that are able to enroll only 50-60 percent of the beneficiaries.

Another point that possibly had a bearing on supplemental food coverage was, the shift from the PL 480 Title II provided CSB programmed by CARE to the state government provided and managed grain to match the Title II RSO. Although, eventually all state governments provided the grain, for a considerable period of time during this transition, about six months to a year, varying from state to state, regular and adequate availability of grain, its logistics and management was challenging. In the wake of commodity constraints some states such as West Bengal and Andhra Pradesh withdrew the THR distribution, which further affected supplemental food coverage.

Besides the commodity related aspects mentioned above, NHD quality varied considerably across districts. Improving the quality of NHDs across all program areas, i.e., the use of other approaches such as catchment area approach, tracking drop-outs to strengthen the NHDs is important.

Figure 6.2: Receipt of supplemental food during pregnancy or lactation by women falling in the lower and upper half of a socioeconomic score, mothers of children 0-5 months old, Endline (2006).



Targeting the more vulnerable

Figure 6.2 presents the differential supplemental food coverage among women divided into two groups on either side of a cut-off that is the approximate mid-point of a socioeconomic score (SES) derived from a set of seven socio-demographic variables.[6] Two points should be borne in mind while interpreting this data: (i) such a division provides insights into targeting the more vulnerable within a group that is largely vulnerable, since INHP-II operates generally in rural and tribal ICDS blocks; and (ii) this criteria is different from the one the ICDS supplemental feeding eligibility criteria used prior to the universal supplemental feeding approach. As seen in Figure 6.2 in most states there are only marginal differences in the supplemental food coverage rates between the two groups of pregnant/lactating women on either side of the mid cut-off point. Uttar Pradesh shows the largest differences between the two groups, indicating significantly better coverage among the more vulnerable. The figure also shows that in states with high coverage rates, the differentials in coverage between the two groups are further minimized.

A comparison of supplemental food coverage among women and children belonging to SC/ST and to other castes at endline (Table 6.4) also shows only a marginally higher coverage of supplemental food among the SC/ST groups in most states, with the exception of Rajasthan and West Bengal which show much better coverage of SC/ST groups as compared to the other groups. Despite the relatively higher coverage rates seen among the SC/ST groups, in real terms the coverage rates in Rajasthan and Uttar Pradesh remain unacceptably low (45-58 percent). If "true" universalization of services is to be achieved, strategies to address exclusion will be required.

[6] The variables included in the socioeconomic score are caste, maternal education, maternal employment, type of housing, access to toilet facilities, electricity and potable water. A score of zero or one was assigned to each respondent for each variable and the sum of these scores formed the SES score for a given respondent. The sample was split into approximately equal halves at a cut-off score closest to the median, to give two relative groups on either side of the median. This was done for each state separately for baseline and endline data sets. The method is described in detail in the paper, *Methods Used for Assessments*

Table 6.4: **Receipt of supplemental food at endline by caste (SC/ST and others), mothers of children 0-23 months old, Endline (2006).**

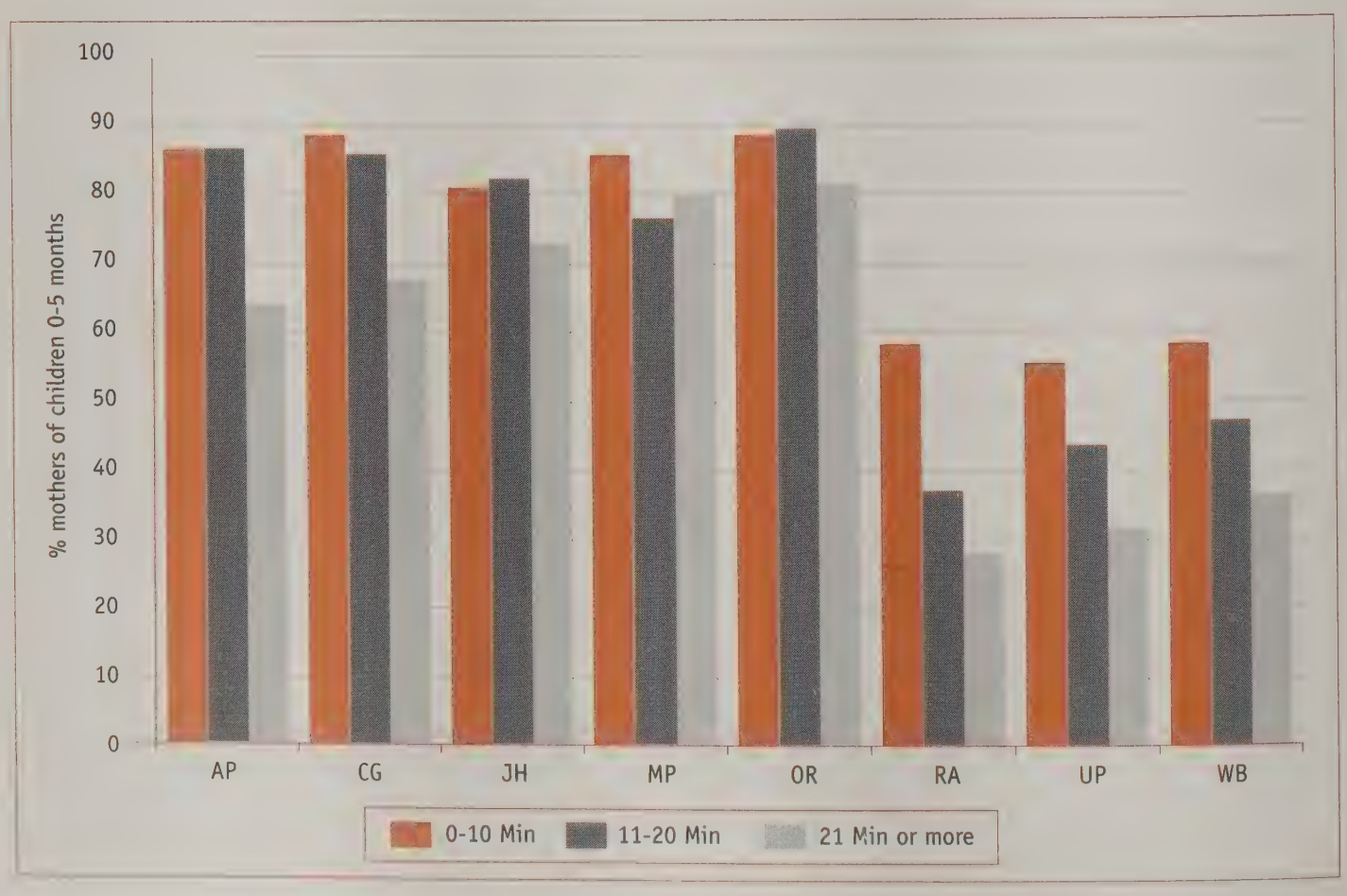
State	n		During pregnancy		During lactation		For children > 6	
	SC/ST	Others	SC/ST	Others	SC/ST	Others	SC/ST	Others
Andhra Pradesh	*228*	*532*	88.3	82.9	79.1	76.5	54.0	48.6
Chhattisgarh	*402*	*275*	88.4	86.0	91.4	88.3	86.6	79.7
Jharkhand	*352*	*293*	78.7	75.1	83.6	79.3	79.8	80.0
Madhya Pradesh	*328*	*361*	86.1	79.5	85.7	77.6	77.1	71.6
Orissa	*361*	*336*	86.6	83.1	86.6	88.8	88.3	87.5
Rajasthan	*224*	*455*	58.1	40.9	55.0	39.8	49.6	32.6
Uttar Pradesh	*286*	*382*	44.9	40.4	46.5	43.2	50.1	39.2
West Bengal	*279*	*392*	75.6	59.2	59.4	46.4	62.4	44.7
Program wide	*2460*	*3026*	74.1	67.0	71.8	66.3	68.0	59.9

The evaluation research data for supplemental food coverage for pregnant women analyzed by caste shows that in Andhra Pradesh while significant gains in coverage of SC/ST groups were seen in both the intervention and the comparison areas, the intervention areas demonstrated larger increases (26.1 percent in the intervention areas vs 14 percent in the comparison areas). In Uttar Pradesh the intervention area showed an overall increase of 11.3 percent in supplemental food coverage with an increase of about 10 percent in the coverage of SC/ST groups, whereas the comparison area showed a 5.4 percent decline in overall supplemental food coverage with decline of about 10 percent in the coverage of SC/ST groups. These results show that supplemental feeding rates among SC/ST groups are better in the INHP-II areas as compared to the non-intervention areas. The sharper decline of coverage rates in the SC/ST groups when overall coverage declined could possibly reflect the lesser priority accorded to them when resources are constrained.

Effect of distance from AWC on coverage

An important factor generally believed to influence the uptake of services, is the distance of the home of the participants from the AWC. Endline data presented in Figure 6.3 show the supplemental food coverage rates by the location of the

Figure 6.3: **Receipt of supplemental food during pregnancy mothers of children 0-5 months old, Endline (2006).**



household in terms of the time taken to walk to the AWC. In most states coverage rates were affected when it took more than 20 minutes to walk to the AWC (About 8-25 percent of the respondents stay at distance more than 20 minutes away from the AWC). In Rajasthan, Uttar Pradesh and West Bengal coverage levels appear to progressively decrease beyond more than a 10 minute walk. Similar patterns were seen among families living in the same hamlet as the AWC vs other hamlets. Possibly provider outreach decreases as distance increases, or the participants' ability to access services decreases as distance increases, or other social factors such as caste issues could play a role, since SC/ST or lower caste habitations are often located at a distance from the main village.

In sum, it appears that supplemental food coverage improved in several states, although in some states coverage was sub-optimal, while the NHD and THR approaches proved successful across many states in improving coverage of under-threes and nursing mothers. To improve supplemental food coverage to universal levels, further attention is needed to overcome constraints with measures like allocation of adequate resources, ensuring stable and adequate supplemental food availability, better logistics management, defining AWC catchment areas to ensure that all habitations and families are covered, especially the more vulnerable, like SC/ST and those that live at a distance from the AWC.

The Influence of Supplemental Food on Health Services Coverage

This section reviews the evidence for the influence of supplemental food on health service coverage as well as factors such as provider contacts that are associated with positive nutrition and health behaviors. Data from the endline survey for variables discussed below, and analyzed by receipt of supplementary food is used to examine this effect.

Antenatal care

The influence of supplemental food on antenatal care coverage is examined in terms of one and three antenatal check-ups (ANCs), and receipt of IFA tablets during pregnancy (measured by receipt of any IFA and 90 or more IFA tablets).

As seen in Table 6.5, except in states where ANC rates are over 90 percent (Andhra Pradesh and West Bengal have ANC rates of 93 and 95 percent for three ANCs and one ANC respectively), in all other states pregnant women who received supplemental food during pregnancy consistently show significantly higher ANC coverage rates compared to women who reported not to have received food. The differences are especially large in Chhattisgarh, Jharkhand and Orissa, ranging from 14-24 percentage points. At the program level, among those pregnant women who had received supplemental food, ANC rates for one and three ANCs were about 75 and 45 percent respectively, against 68 and 32 percent among those who had not received supplemental food. In both cases the differences are significant.

Table 6.5 also indicates higher rates for IFA receipts (any IFA tablets) across all states among pregnant women who received supplemental food compared to those who did not, the differences ranging from about 15 percent in West

Table 6.5: Utilization of health services during index pregnancy by receipt of supplemental food (mothers of children 0-5 months old), Endline survey

	Andhra Pradesh		Chhattisgarh		Jharkhand		Madhya Pradesh		Orissa		Rajasthan		Uttar Pradesh		West Bengal		Program wide	
Received SN during pregnancy	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
n	*103*	*567*	*94*	*592*	*119*	*471*	*110*	*504*	*95*	*595*	*316*	*307*	*312*	*302*	*302*	*332*	*1451*	*3670*
Received at least one ANC	100.0	100.0	97.6	98.8	56.2	79.6	56.9	74.4	69.5	88.2	34.9	45.3	36.1	52.1	91.7	95.2	68.3	79.5
Received 3 or more ANCs	91.3	93.2	26.8	45.9	22.6	36.5	32.5	40.8	27.3	52.1	10.5	14.8	10.7	19.2	55.6	65.3	31.8	44.9
Received any IFA tablets	68.6	88.3	72.7	90.6	49.5	88.8	70.1	93.5	76.9	95.8	33.2	75.3	55.2	87.4	81.7	96.6	63.5	89.7
Received 90 or more IFA tablets	34.8	51.5	30.4	56.1	18.5	53.0	29.9	51.7	45.0	73.4	10.8	36.4	30.9	59.4	54.9	66.5	33.2	57.7

Source: Program wide evaluation

Table 6.6: Coverage of health services among those who received supplemental food during pregnancy, mothers of children 0-5 months, Nutrition Evaluation Research, Baseline (2001) and Endline (2006)

State	Indicators	Intervention district						Comparison district					
		Baseline			Endline			Baseline			Endline		
		Received SN during pregnancy			Received SN during pregnancy			Received SN during pregnancy			Received SN during pregnancy		
		No	Yes	Difference	No	Yes	Difference	No	Yes	Difference	No	Yes	Difference
UP	*n*	*521*	*275*		*349*	*408*		*555*	*148*		*533*	*133*	
	Received 3 or more ANC	20.5	20.7	**-0.2**	24.6	33.3	**-8.7***	16.2	15.5	**0.7**	8.3	8.7	**-0.4**
	Received 90 or more IFA	27.8	38.9	**-11.1***	41.5	70.8	**-29.3***	27.0	36.2	**-9.2***	26.8	42.0	**-15.2***
	ANM CONTACT	NA	NA		44.4	64.0	**-19.6***	NA	NA		20.6	21.7	**-1.1**
	AWW CONTACT	NA	NA		46.1	77.9	**-31.8***	NA	NA		9.8	23.2	**-13.4***
AP	*n*	*428*	*190*		*184*	*313*		*461*	*179*		*257*	*247*	
	Received 3 or more ANC	95.7	90.0	**5.7***	95.1	95.5	**-0.4**	88.1	86.6	**1.5**	90.3	89.5	**0.8**
	Received 90 or more IFA	4.2	12.2	**-8.0***	9.2	28.4	**-19.2***	20.0	19.0	**1.0**	25.3	33.2	**-7.9**
	ANM CONTACT	NA	NA		26.6	47.3	**-20.7***	NA	NA		28.8	38.1	**-9.3***
	AWW CONTACT	NA	NA		26.6	56.9	**-30.3***	NA	NA		11.7	27.5	**-15.8***

* Difference significant at 95% confidence level

Bengal to over 42 percent in Rajasthan. Similarly differences among recipients and non-recipients of supplemental food are seen in the coverage rates for the recommended 90 or more IFA tablets. Program wide, these are of the order of over 24 percent, indicating that the receipt of supplemental food has a strong positive association with IFA supplementation.

Table 6.6 shows ANC and IFA coverage rates of pregnant women by receipt of supplemental food from the evaluation research. The Uttar Pradesh data shows higher ANC coverage rates at endline among mothers of children 0-5 months old, who received supplemental food during pregnancy compared to those who did not. Such differences are not seen in the comparison areas, either at baseline or at endline, indicating that INHP strategies contributed to this association, i.e., they helped optimize the benefits of supplemental food. The evaluation research from Andhra Pradesh, where ANC rates are over 90 percent in both the intervention and the comparison areas shows virtually no differences between pregnant women who received supplemental food and those who did not. This is not surprising given the over 90 percent coverage and the strong health service delivery systems in the state. In the case of IFA supplementation, data from both states indicates a strong association with receipt of supplemental food at endline, in both the intervention as well as the comparison areas, the association being stronger in the intervention areas. Again, this possibly indicates that INHP-II strategies were in linking the delivery of supplemental food with the provision of health services.

Immunization

The direct influence of food supplements on immunization coverage rates is assessed by examining the differentials in children's full immunization coverage rates between mothers who reported having received supplemental food for themselves (during index pregnancy or lactation) or by their children and those who reported not having received them. Table 6.7 shows that, across states complete immunization rates for children whose mothers have received supplemental food during pregnancy or lactation are higher than those whose mothers did not receive supplemental food, the differences ranging from about Six percent in Andhra Pradesh to over 36 percent in Orissa. The relationship holds strongly across all three periods in the states of Orissa, Rajasthan and Uttar Pradesh, whereas in states like Andhra Pradesh and West Bengal, where overall immunization rates are high, the differences between supplemental food recipients and non recipients are only marginal.

However, despite NHDs and the supplemental food-immunization association, it is clear that even food recipients do not have satisfactorily high immunization rates in most states. Several elements such as defining the denominators, systematic tracking of individual children by preparing due-lists for each sessions, availability of vaccines and opening of vials irrespective of the number of children are critical to increase the immunization coverage rates, along with addressing the issue of NHD quality variability across the program.

Table 6.7: Influence of supplemental food receipt on complete immunization rates (card or recall), 12-23 months, Endline (2006)

State	State averages	Supplemental food during pregnancy			Supplemental food during lactation			Supplemental food for child 6-23 months old		
		No	Yes	Difference	No	Yes	Difference	No	Yes	Difference
AP	*468*	*70*	*398*	*-328*	*99*	*369*	*-270*	*223*	*245*	*-22*
	82.0	75.7	83.7	-8.0	77.8	83.7	-5.9	83.0	82.0	1.0
CG	*384*	*49*	*335*	*-286*	*36*	*348*	*-312*	*60*	*324*	*-264*
	43.3	38.8	44.8	-6.0	22.2	46.3	-24.1*	48.3	43.2	5.1
JH	*437*	*100*	*337*	*-237*	*80*	*357*	*-277*	*78*	*359*	*-281*
	63.9	59.0	66.8	-7.8	53.8	67.5	-13.7*	64.1	65.2	-1.1
MP	*409*	*75*	*334*	*-259*	*74*	*335*	*-261*	*108*	*301*	*-193*
	55.4	42.7	58.4	-15.7*	41.9	58.5	-16.6*	49.1	57.8	-8.7
OR	*428*	*60*	*368*	*-308*	*49*	*379*	*-330*	*48*	*380*	*-332*
	64.7	35.0	69.6	-34.6*	32.7	68.9	-36.2*	37.5	68.2	-30.7*
RA	*450*	*239*	*211*	*28*	*245*	*205*	*40*	*281*	*169*	*112*
	40.2	30.5	52.1	-21.6*	30.6	52.7	-22.1*	32.0	55.0	-23.0*
UP	*466*	*266*	*200*	*66*	*255*	*211*	*44*	*252*	*214*	*38*
	43.0	37.2	50.5	-13.3*	37.3	49.8	-12.5*	35.7	51.4	-15.7*
WB	*474*	*154*	*320*	*-166*	*200*	*274*	*-74*	*210*	*264*	*-54*
	74.4	67.5	75.9	-8.4*	66.0	78.5	-12.5*	70.0	75.8	-5.8

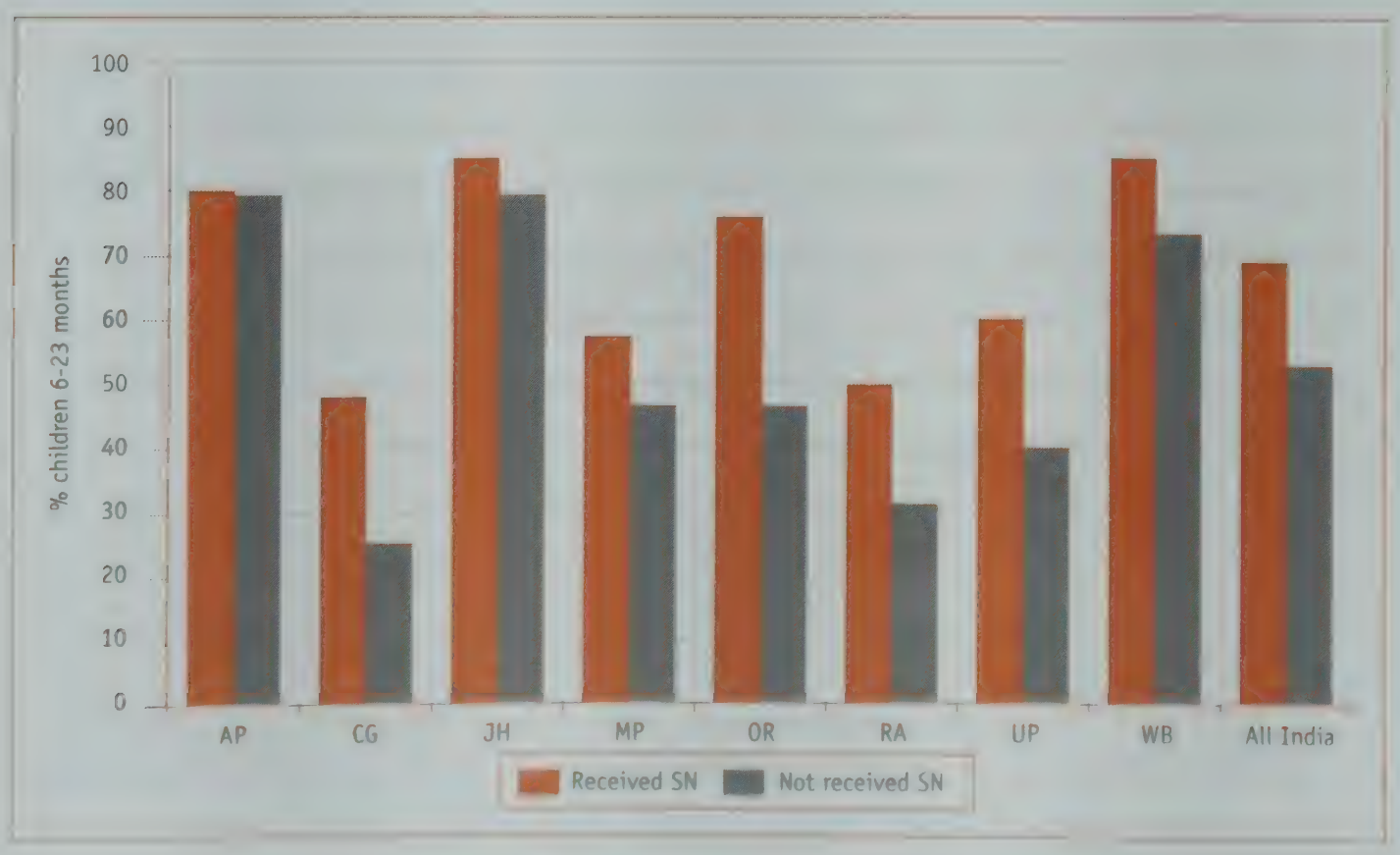
*difference significant (p<0.05)

Vitamin A coverage

Figure 6.4 shows the association of vitamin A coverage (first dose) of children and receipt of supplemental food by mothers of children less than six months of age and by children 6-23 months of age. Coverage rates for subsequent doses of vitamin A are very low, therefore such an analysis, beyond the first dose is not possible. The first dose of vitamin A is administered to children along with the measles vaccine at the NHD.

At the program level, a significantly higher proportion of children under two who received supplemental food or whose mothers received supplemental food during lactation had received the first dose of vitamin A compared to those who did not.

Figure 6.4: Coverage of Vitamin A (1st dose) by receipt of supplemental food during lactation, Endline (2006).



The trend is seen across all states, the differences between the two groups being larger in states where the overall vitamin A supplementation rates are relatively low. Baseline data also indicates a similar association, although the differences in vitamin A coverage between children whose mothers received supplemental food and those who did not, is not significant.

Provider contacts

Table 6.8 presents data comparing home contacts by the AWW and by the ANM in the month previous to the survey among recipient and non-recipients of supplemental food. Program wide, across every state and across all categories of participants (children under two, pregnant and lactating women), the proportion of women who received home contacts by the AWW and surprisingly, the ANM, is significantly higher (1.5-2 folds) among recipients of supplemental food than among non-recipients. This indicates that those receiving supplemental food are far more likely to have received another service at home (not at the center) than those not receiving supplemental food.

The effect of supplemental food receipt interestingly extends to home contacts by ANM as well. Significantly higher ANM contacts were seen among mothers and among those who had received supplemental food (either for themselves or their children) than those who had not. In many cases the contacts in the supplemental group were two to three folds than in the other group. It should be noted that despite the differential, less than a half of the women had reported an ANM home contact. These findings indicate that supplemental food exerts a strong indirect influence on outreach health services. This dimension of the influence of supplemental food is important, given the association of home contacts by providers made at critical life periods (third trimester of pregnancy, first week of birth and until the child is six months old) with improved behaviors vis-à-vis newborn care, infant and young child feeding demonstrated in the periodic rapid assessment surveys done in one district in each of the eight states.

The evaluation research endline data (Table 6.6) also indicates significantly higher provider contacts, both by the AWW and the ANM, in intervention areas in both states, whereas in the comparison areas, an association is seen only with respect to AWW contacts. This provides evidence to indicate that the benefits of supplemental food on health service provider contacts are seen only when supplemental food is linked with health services, such as was done in the INHP-II areas.

In sum, receipt of supplemental food bears a strong association with health service coverage. The effect is possibly mediated through multiple mechanisms. NHDs, operationally linking ICDS and health services, provide the attraction of supplemental food, and at the same time make services predictable. It is possible that supplemental food serves as the "tangible" incentive for enrolment of pregnant women, nursing mothers and children under two into the ICDS registers, thus putting them also on other service registers. Possibly the increased center-based interface for food distribution (weekly or fortnightly) with providers leads to coverage for other services, as well as increases the likelihood for home contacts by providers. Field observations show that often during food stock-outs, attendance on NHDs drops, indicating that the incentive effect of food is

Table 6.8: Home contacts by AWW and ANM in the month prior to survey by receipt of supplemental food, mothers of children 6-23 months old, Endline (2006)

State	ANM		AWW		ANM		AWW		ANM		AWW	
	Received SF during pregnancy				Received SF during lactation				SF for children > 6			
	Not received	Received	Not received	Received	Not received	Received	Not received	Received	Not received	Received	Not received	Received
Andhra Pradesh	37.7	55.7	46.0	68.7	40.1	56.7	47.2	70.5	44.0	61.7	58.9	71.5
Chhattisgarh	21.5	43.3	25.4	54.3	18.5	43.0	22.7	53.5	29.2	42.8	35.3	53.6
Jharkhand	15.5	34.6	40.7	61.3	12.9	34.1	35.7	61.3	20.8	32.6	36.9	61.5
Madhya Pradesh	10.0	19.1	19.5	38.3	11.0	19.0	22.6	37.8	10.1	20.1	25.2	38.4
Orissa	10.2	23.5	23.5	44.7	8.8	23.3	20.1	44.5	13.0	22.7	21.6	44.2
Rajasthan	8.4	25.1	11.5	33.2	7.9	26.4	10.3	35.6	8.7	28.2	11.7	37.7
Uttar Pradesh	34.5	52.6	47.4	66.5	32.6	54.1	43.8	70.0	32.0	55.2	45.6	68.2
West Bengal	15.4	20.0	31.7	48.6	15.2	21.4	34.2	50.9	15.3	21.4	31.6	53.4
Program wide	20.5	36.1	32.9	54.2	19.5	36.7	31.3	55.4	23.1	37.3	35.0	55.8

ANM Auxiliary Nurse Midwife
AWW Anganwadi Worker

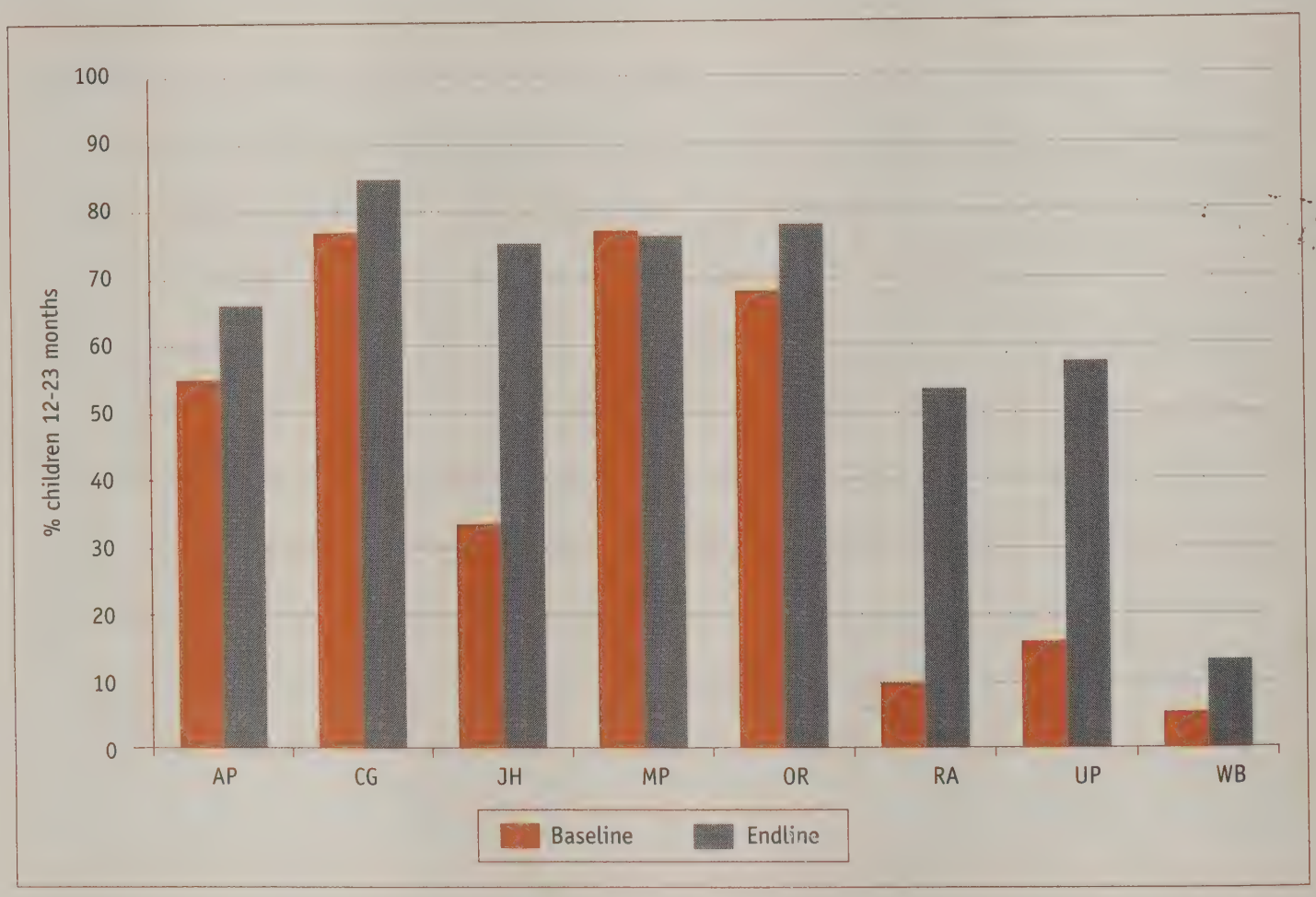
important. At the same time service delivery having become more predictable due to systematic NHDs has possibly played an equally, if not more, important role in improving health and ICDS service coverage. Regardless of how the influence of food is mediated, the strong association with health service coverage demonstrated in INHP-II suggests that the benefits of supplemental food are optimized when linked with health services. Such an association may, or may not, hold true otherwise.

The role and effectiveness of NHDs

Program monitoring data shows that during the transition from CARE supplied CSB to state government provided grain, NHDs were affected and the attendance on NHDs had dropped. However, in the last year, almost 60 percent of the AWCs reported conducting regular NHDs. West Bengal remained at about 43 percent[7] and in Chhattisgarh and Rajasthan over 75 percent of AWCs were conducting NHDs regularly. The endline interviews of AWWs also provide a similar picture. With the exception of West Bengal, where the operationalization of providing THR on the immunization day did not quite take root, almost 90 percent or more of AWWs interviewed at the endline across states reported that the NHD had been held at least once in the last three months. Eighty percent of the AWWs in the endline survey reported that vaccines were administered on the same day as food distribution at least once in the previous three months. About 68 percent (range 52-84 percent) reported that immunization sessions had been held at the AWC in each of the three months, and 61 percent (range 47-77 percent) reported that this was accompanied by food distribution in each of the three months.

Figure 6.5 provides evidence from baseline and endline surveys that over the life of INHP-II, NHDs have succeeded in extending immunization services to be delivered at the AWC. In Jharkhand, Rajasthan and Uttar Pradesh, where

Figure 6.5: **Proportion of children immunized at the AWC, Baseline (2001) and Endline (2006).**



[7] In the case of West Bengal this represents only health service delivery, since West Bengal does not distribute THR. As per the strict definition of NHD the West Bengal NHD data is 3 percent.

immunization rates were low at the baseline, huge increases in the proportion of children getting immunized at the AWCs were seen at endline, and modest increases in most other states were seen. Madhya Pradesh maintained a high of over 75 percent from baseline to endline, and in West Bengal immunization happens mostly at the sub-health centers and immunization rates are fairly high. The role of AWC remained marginal, although the AWWs may still play a role in mobilizing families to seek immunization services.

Thus, NHDs did succeed in linking supplemental food distribution and health service delivery, and the larger ICDS-Health coordination at the village level. The NHDs also provided a forum for community engagement, by engaging community volunteers, mother's groups, women's self-help groups in activities such as informing and calling mothers to immunization sessions, and helping in supplemental food distribution. This element has been highlighted in the report of "Assessment of CARE India's INHP Tools and Change Agents" a external qualitative study conducted in March 2007. It is possible that the energizing effect has also indirectly contributed to enhancing service utilization, supplemental food as well as health services. The paper, *Widening Coverage of Primary Immunization*, discusses more details of the NHD-immunization association.

The Benefits and Costs of Supplemental Food

ICDS is criticized by many for the costs it incurs on and the attention it devotes to the supplemental feeding of pregnant women, nursing mothers and children up to six years of age, because of the apparent lack of commensurate benefits on the health and nutritional status of these groups. Some perceive ICDS to be unduly preoccupied with supplementary feeding and even label AWCs as *"daliya or khichdi centers"*. They also consider the time spent by the AWW on supplemental feeding related activities such as food distribution, preparation as a "distraction" from other responsibilities like conducting pre-school education and counseling. On the other hand, there exists another perspective that looks to the ICDS supplemental feeding alone to improve nutritional status of those that receive it and as a solution to the problem of malnutrition. These perspectives largely take into consideration the direct benefits of food, while the indirect benefits generally tend to get underestimated.

COMMUNITY HEALTH
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AND
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This section discusses the costs of ICDS supplemental food along with its benefits that the INHP-II evidence has brought out. It does not get into a cost-benefit analysis, since it is clear that irrespective of cost considerations, the ICDS is committed to universalizing its services, including food supplementation, at least in the short to the medium term.

Of the overall 2007 to 2008 ICDS budget of Rs. 70,930 million ($1.77 billion), about 51 percent accounts for supplemental feeding and the average weighted per annum per beneficiary cost is Rs. 756 ($19).[8] This includes costs of

[8] Weighted average derived by applying NFHS-III population norms for each of the INHP states and the ICDS supplemental food allocation of Rs. 2/day for children, Rs. 2.30 for pregnant/nursing mothers and Rs 2.70 for severely malnourished children for 300 feeding days a year. Conversion rate of Rs. 40 to a dollar has been used

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transportation, logistics, fuel and other miscellaneous costs, while management and distribution of the supplemental feeding does involve a certain level of ICDS staff time, since no cadre of ICDS functionaries are dedicated solely to managing supplemental feeding, no staff costs are included into supplemental feeding costs, assuming that ICDS will continue to have the same management and staff structure for delivery of its services, with or without supplemental feeding services.

The INHP-II experience clearly indicates the value of NHDs in bringing together communities and frontline workers of the ICDS and the Health Departments to facilitate the delivery of services of both departments. Evidence discussed in earlier sections has highlighted the positive influence of food on health service coverage. Coverage rates for antenatal services, such as antenatal checks, IFA supplementation, and childhood immunization are significantly higher in groups that received supplemental food. Also significant is the finding that provider contacts, not just by the AWW but also by the ANM, were significantly higher in the groups that received supplemental food. Provider contacts have been found to be a good proxy indicator for counseling provided at home to mothers, which in turn is associated with behavior change related to several determinants of nutritional status such as infant feeding practices, newborn care, immunization.

Given the above benefits, it would be simplistic to look at the cost of food as a simple food transfer to families. The benefits of this cost extend to the improved utilization and delivery of services, the improved coverage of health services and to the influence it exerts on provider behavior as evidenced through increased home contacts. The supplemental food costs could possibly also be influencing "inclusion" of the more vulnerable and the generally excluded, given the higher supplemental food coverage among SC/ST seen in all states, although coverage of these groups is still sub-optimal in certain states. Thus, the cost of ICDS supplemental food needs to be looked at in a broader perspective than it currently is.

The GoI remains committed to providing supplementary food through the ICDS, and the ICDS is now mandated to universalize the provision of supplementary food. The question therefore is not whether ICDS should be investing in food supplementation, but of how the supplemental food can be used in the most meaningful way to contribute to improving nutrition and health of women and children. Supplemental food costs remaining constant, INHP-II has demonstrated at scale that by using mechanisms such as the NHDs that closely link supplemental food with health services, health and nutrition outcomes can be influenced. A yet greater return on costs of supplemental food can be expected with further improvement and use of tracking mechanisms, more effective counseling during critical periods of life, overcoming common operational program constraints and better addressing 'exclusion'.

Conclusion and Lessons Learnt

INHP strategies have been effective in operationally converging ICDS and Health services. Specifically, the NHD and the THR approach have proven effective in linking supplemental food distribution with services such as immunization, ante-

natal care, vitamin A and IFA supplementation. NHDs have helped strengthen predictable outreach services where they were not happening earlier and have provided a formal forum not only for ICDS-Health convergence, but for the engagement of local communities, both program participants and community volunteers, in the program. THR, an integral part of the NHD approach, have served as an incentive and in several states have helped improve participation of the priority groups, i.e., pregnant and nursing mothers and children under three years of age, and groups that ICDS has in the past not been able to effectively reach. Although supplemental food coverage improved in several states, in some states coverage was sub-optimal. There is some evidence that sharing of supplemental food given as THR with other family members, a common concern related to THR, reduced to an extent.

There is clear and consistent evidence of a strong association between the receipt of supplemental food and health service coverage, at least when the two are linked together as was done in INHP-II. Significantly higher coverage rates for immunization, vitamin A and IFA supplementation are seen among women and children who received supplemental food as compared to those who did not. Surprisingly, the influence of supplemental food extends to services delivered at the doorstep, such as home contacts. The differential between recipients and non-recipients of supplemental food is even larger in this case. While food clearly serves as an attraction for participation in NHDs, the association with non-center based services such as home contacts suggests that the supplemental food-health services association is mediated through multiple mechanisms, including those not exclusively tied to activities at the center. Enrolment for supplemental food possibly puts the beneficiaries on the ICDS list which strongly influences the "beat" of the AWW and the ANM. While a fair proportion of non-recipients do avail of center-based services despite not receiving food (or perhaps avail of them from elsewhere), service providers tend to have a strong preference for visiting primarily food-recipients over non-recipients. Regardless of how the influence of food is mediated, the strong association with health service coverage suggests that the benefits of supplemental food are optimized when linked with health services.

Supplemental food coverage, including the regularity of and attendance at NHDs, is heavily influenced by the regular and adequate supply of supplemental food commodities. Therefore, adequate resource allocation based on a realistic beneficiary assessment, timely release of budgets and procurement, supply chain management and logistics to ensure a stable and adequate supply of commodity at the AWCs are critical. Equally important are factors related to health service delivery such as the presence of the ANM on NHDs, availability of vaccines, syringes and cold chain. Given the relatively smaller effect of supplemental food on ANCs, presumably due to a lack of privacy at the AWC, attention to the provision of some level of privacy at AWCs for ANCs is perhaps required.

Despite the higher coverage rates for immunization and other variables discussed above among supplemental food recipients, in many states these are still low. While improvements can be expected through linking supplemental food and health services, as demonstrated by INHP-II, supplemental food alone, or for that matter NHDs alone, cannot be expected to resolve the problem of malnutrition. Perhaps,

larger gains can be expected by strengthening the variable quality of NHDs, defining AWC catchment areas to ensure that all habitations and families are covered, especially the more vulnerable like the SC/ST and those that live at a distance from the AWC. Consistent effort to synergistically use approaches to enhance coverage, minimize exclusion, track left-outs, provide effective behavior change messages, and to overcome common operational program constraints will be critical.

The ICDS is committed to providing services, including supplemental food, universally to all pregnant and lactating women and children under six years, and to extend the ICDS scheme to all villages. Therefore, given the strong association between receipt of supplemental food and health coverage, the use of supplemental food in the most meaningful way to contribute to improving nutritional and health outcome of women and children assumes great importance. The universalization of ICDS and health services opens up possibilities of expanding INHP-II approaches, such as the NHD, THR, catchment area, and commodity supply chain management to improve coverage and strengthen the ICDS and the RCH programs and their operational linkages.

(Contd. from inside of the front cover)

feeding, were strongly associated with receipt of food supplements from ICDS. This strong association extended to services and home visits by the Auxiliary Nurse Midwife (ANM) as well.

This suggests that the reach of health services at the village level is strongly influenced by the Anganwadi workers (AWW) beneficiary lists. While coverage rates for services such as immunization were higher among food-recipients, in states with overall low coverage, the coverage of even food recipients was low, suggesting that factors other than food receipt remain more important determinants.

The average weighted per annum per beneficiary cost for supplemental feeding is Rs. 756 ($19). In the wake of GoI's policy to universalize ICDS program, the challenge is to maximize the benefit of this investment. The INHP-II experience provides some answers, particularly in linkage of food supplementation with improved reach of health services.

Nutrition and Health Days (NHDs) have played an important role in linking supplemental food and health service coverage association, and in the larger ICDS-Health coordination. These have also provided a forum for community engagement, such as for the informing and calling mothers to immunization sessions by community volunteers, mother's groups helping the AWW in supplemental food distribution, etc. The universalization of ICDS and health services makes it possible for approaches such as the NHD, THR, catchment area, and commodity supply chain management to improve coverage and further strengthen ICDS and Reproductive and Child Health programs and their operational linkages.

This series of working papers was envisioned and written by persons actively involved in the program design and implementation. USAID/BASICS directly contributed to the writing and production of this series of papers in several ways before it closed in India in December 2007. A number of data support and field staff gave invaluable contributions, and the papers were reviewed by CARE-India and USAID/India staff.

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About RACHNA

Two major projects of the Reproductive and Child Health, Nutrition and HIV/AIDS (RACHNA) program of CARE-India completed five years of work supported by funds from USAID in late 2006. The second phase of Integrated Nutrition and Health Project (INHP-II) was aimed at helping reduce child malnutrition and mortality. The rural component of the *Chayan* project primarily addressed the unmet need for spacing methods, while its urban component attempted to reduce HIV transmission among at-risk groups. Together, the projects covered 78 districts and 22 cities, spread over 10 states, and worked closely with key national programs and a spectrum of different partners. This series of working papers documents the results and lessons from these five years.

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